

Illinois U Library



the **ILLINOIS ENGINEER**

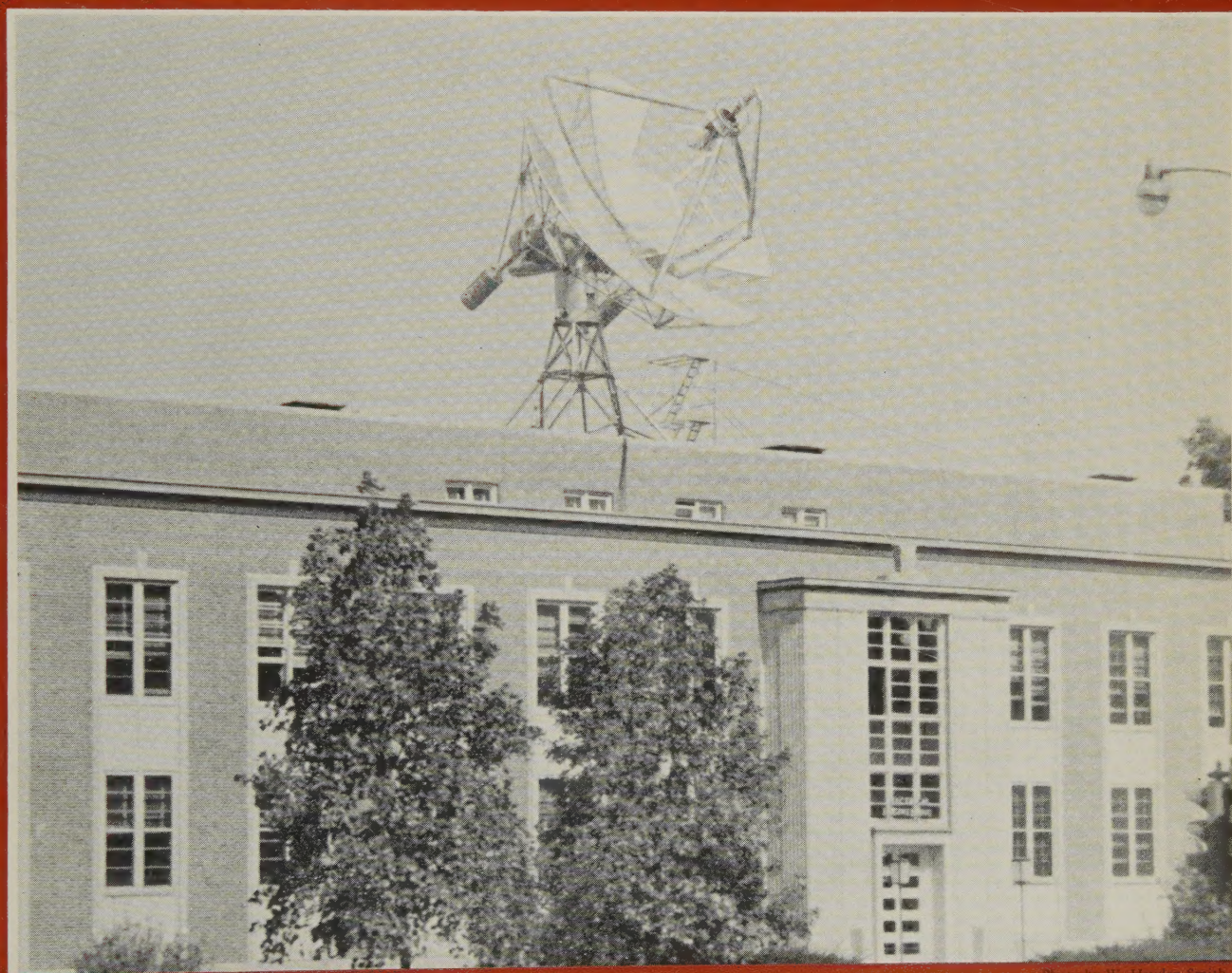


Photo by W. Hayden Smith

GIANT RADIO AND RADAR RECEIVER



THE ILLINOIS ENGINEER.
NOVEMBER 1957,
VOLUME XXXIII, NO. 11

University of Illinois Library
Undergraduate Division
Navy Pier
Chicago 11, Ill.

ILLINOIS SOCIETY OF PROFESSIONAL ENGINEERS, Incorporated

Affiliated with the National Society of Professional Engineers

A. W. NEUREUTHER, President (73)*

ROYCE E. JOHNSON, Past President (73)

FRANK W. EDWARDS, Vice-President (73)

A. D. SPICER, Secretary-Treasurer (73)

P. E. ROBERTS, Executive Secretary, Editor

H. E. BABBITT, Secretary Emeritus

BOARD OF DIRECTION

ANDREW W. NEUREUTHER, President (73)*
FRANK W. EDWARDS, Vice President (73)
A. D. SPICER, Secretary-Treasurer (73)
ROYCE E. JOHNSON, Past President (73)
WAYNE W. WALLACE, National Director (73)
DWAINE M. WALLACE, National Director (74)
J. D. VOORHEES, Chairman I.E.C.
Representatives (74)
JOHN HENLINE, Ambraw (73)
L. D. HUDSON, Capital (74)
A. C. KESSELL, Capital (73)
HERMAN W. DORN, Central Illinois (73)
JOHN E. HOUSIAUX, Central Illinois (74)
EDWARD M. ANDERSON, Champaign Co. (73)
C. DALE GREFFE, Champaign Co. (74)
H. F. SOMMERSCHIELD, Chicago (73)
ANTHONY ZUMMER, Chicago (74)
RICHARD THORNTON, DuKane (74)
C. R. RISELING, Egyptian (73)
A. L. DIERSTEIN, Illinois Valley (73)
WILLIAM S. GRAY, Joliet (73)
IRWIN R. LIETZKE, Lake County (73)
J. D. VOORHEES, Madison County (73)
KARL A. BRUGGER, Peoriarea (73)
ARNOLD LUNDGREN, Rockford (74)
R. H. RENWICK, Rock River (74)
A. J. FEICKERT, St. Clair (73)
CLIFFORD E. MISSMAN, West Central (74)
CHARLES N. BAINBRIDGE, Jr. Rep. (73)
P. E. ROBERTS, Executive Secretary

* Refer to Annual Meeting at which present term expires.

CHAPTER OFFICERS FOR 1957

CHAPTER	PRESIDENT	VICE-PRESIDENT	SECRETARY-TREASURER
<i>Ambraw</i>	I. C. Bliss	B. P. Johnson	Carl H. Wiley
<i>Capital</i>	R. Dean Collins	H. L. Brantley	Charles Nelson, Sec'y C. R. Ihlenfeldt, Treas.
<i>Central Illinois</i>	J. Parke Boyer	Gilbert D. Henning	Robert E. Schwartz
<i>Champaign County</i>	Gordon V. Carlson	J. Ray Carroll	Wendel F. Kent
<i>Chicago</i>	John G. Duba	Linas H. Brown	George Chlebiecki, Sec'y Gerald Marks, Treas.
<i>DuKane</i>	Donald S. Magowan	James E. Scott	John J. Fast
<i>Egyptian</i>	Joseph H. Kirsch	Paul O. Hall	F. H. Persson
<i>Illinois Valley</i>	Francis E. Sexton	R. A. McClevey	T. H. Norris
<i>Joliet</i>	Robert A. Brown	Howard Hassert	Bernard Anderhous, Sec'y Gerald Marks, Treas.
<i>Lake County</i>	Urban C. Neyer	Kenneth E. Welton	R. A. Rasmussen, Sec'y Emery Ikan, Treas.
<i>Madison County</i>	Charles K. Graves	John Knottnerus	Tom Shift
<i>Peoriarea</i>	Paul L. Zumwalt	Oscar Frost	Emmett L. Smith
<i>Rockford</i>	Linden C. Hunt		John T. Biggers
<i>Rock River</i>	R. H. Renwick	A. H. Ferger	A. W. Osterling
<i>St. Clair</i>	Philip Bauer	Melvin Dobbs	Stanley Petraitis
<i>West Central</i>	Harry Chapman	Norman A. Sauter	Claude F. Bates

ILLINOIS ENGINEERING COUNCIL REPRESENTATIVES

J. D. VOORHEES, Chairman; L. K. CRAWFORD, JOHN G. DUBA, ELLIS DANNER

ILLINOIS SOCIETY OF PROFESSIONAL ENGINEERS

COMMITTEE APPOINTMENTS FOR 1957-58

BOARD OF DIRECTION COMMITTEES

Executive Committee

A. W. Neureuther, Chairman. Frank W. Edwards, A. D. Spicer, Wayne W. Wallace, J. D. Voorhees, William S. Gray.

Honorary Membership

Royce E. Johnson, Chairman. Dwain M. Wallace, Russell E. Gibbs.

Illinois Award

Raymond G. Brichler (73), Chairman. Russell E. Gibbs (73), Merton M. Memler (74), Leo M. Spurling (75), B. P. Johnson (75).

SOCIETY COMMITTEES

Advertising

Robert Lathrop, J. B. Stall, Fritz Jenkins, F. H. Persson, Donald R. Williams, Howard F. West, S. W. Woods, W. L. Fabianic, Tom Landes, F. L. Petitti, Philip Bauer.

Budget and Finance

Frank W. Edwards, Chairman. Andrew W. Neureuther, A. D. Spicer, C. Dale Greffe.

Civil Defense

C. W. Klassen, Chairman. V. E. Gunlock, R. E. Hedgecock, John Doak, W. A. Rakow, L. J. McGonigal, Burt K. Preston, H. V. McCoy, L. P. Murphy, Robert H. Anderson, C. F. Manion, Jr.

Constitutional Amendments

J. H. Morgan, Chairman. J. R. Gardner, O. W. Irwin.

Cooperation with Illinois Architects

J. Raymond Carroll, Chairman. John Bleck, James E. Chiaro, James G. Cooney, J. Philip Dahlberg, Rodney E. Spangler, William T. Hooper.

Ethics and Practice

C. Dale Greffe (73), Chairman. Robert Anderson (73), Clifford Abraham (74), John F. Sweetnam (74), Don Weatherford (75).

Fees and Salaries

Gordon V. Carlson (74), Chairman. Lawrence C. Auby (73), L. K. Crawford (73), Dale V. Hammond (73), Howard Verduin (74), Kenneth R. Wood (74), Robert Schwartz (75), Ellis Danner (75), Louis Pappmeier (75), Herbert Miller.

Legislative

George L. Farnsworth, Jr., Chairman; R. W. Wallace, Vice Chairman. Herman Dorn, Alois W. Graf, Gilbert D. Henning, Arthur M. Kaindl, Roy Kastner, Harry A. Kluge, Silas Cartland, Dale V. Hammond, Warner Johnson, Elmer R. Knight, Arnold Lundgren, James J. McNally, Charles R. Roberts, G. E. Rynearson, Francis E. Sexton, Leo M. Spurling, C. K. Willett, R. Dean Collins, A. J. Zummer.

Membership

J. Raymond Carroll, Vice Chairman; George Foreman, Vice Chairman. C. L. Dees, A. A. Thorsell, Harlow H. Piper, Linas H. Brown, George Booth, Francis Weir, Paul O. Hall,

Arthur Tosetti, Howard Hassert, Richard D. Ciesla, George Shanahan, Tom Landes, Linden C. Hunt, John Shular, William Keeley.

Past Presidents

Royce E. Johnson, Chairman. Dwain M. Wallace, C. W. Klassen.

Public Relations and Publicity

Robert M. Roy, Chairman. Robert Lathrop, Walter D. Hays, Philip Dierstein, William H. Jacobs, Fred H. Persson, Roy Aaron, Russell Kenyon, Sanger Westphal, H. B. Ratcliff, Clarence Wilson, W. M. Swanstrom, Philip Bauer, Norman Sauter.

Resolutions

Gilbert D. Henning, Chairman; M. Dean Wurth, Vice Chairman. D. S. Magowan, J. P. Murphy, R. C. Peppers, James Morrow.

State Building Code

Raymond W. Harrington, Chairman. Charles N. Debes, John Dolio, Loren M. Krause, Arthur Jens, Arthur Ball.

State Engineering Employees

R. A. Lonier, Chairman. Oscar Frost, Ellis Danner, C. E. Holtman, L. D. Hudson.

U.S.G.S. Mapping

Max Suter, Chairman. G. H. Dell, Clifford Missman, Max Seiberling, J. E. Weinell, Charles Danner, William Santana.

Of Interest to I. S. P. E.

PRESIDENT'S MESSAGE

By A. W. NEUREUTHER

Never underestimate the power of your chapter representative in ISPE. He and twenty-eight others like him are supreme in ISPE.

Individual members may find it hard to realize that someone so well known to them and so accessible to each one can wield so much power in the society. Thus the individual member may fail to realize how direct his contact with the state level of society affairs really can be. To exert his influence at state level a member needs only to consult and work with his representative on state matters. A chapter needs only to consult its chapter representative and to instruct him about its wishes in matters concerning the general welfare of the public, the good of the profession, and of the society.

Here is the entrance for ideas and the means for accomplishing things at state level.

The board of direction has final control of all ISPE matters. All state committees and officers are subject to board control. This includes the executive committee and the president. When circumstances permit, the board conducts the current affairs of the society and directs the state officers and the executive committee to carry out its instructions. On matters which of necessity must be handled between board meetings the actions must be ratified by the board later. Failing in this, the matters must be rehandled as directed by the board in order to achieve conformity with the desires of the board.

Likewise in NSPE affairs the national directors have full control. It is only one additional step to process society matters at national level. Merely bring them to the attention of your national director. Here is the way to achievement nationally.

Of course in presenting problems at state or national level it is well to have analyzed the problem as far as possible, to have ascertained all of the available facts, and to have formulated a recommended action. For, if information is lacking during consideration by the board, excessive time may be consumed, or the matter may be referred to committees for ascertaining the facts, for further study, and for recommending courses of action. Prompt action is not hasty action when all of the facts are known and when the course to take is obvious. By good presentation you can do much to expedite society accomplishment for the general welfare.



President Neureuther

So consult your chapter representative. He is the top management of the society. You and he working together can accomplish many good things.

1958 BALLOT INFORMATION

The Illinois Society Constitution provides for the nomination for State Officers and for National Directors by letter nomination.

For the first time, additional names will appear on the Official Ballot, Illinois Society of Professional Engineers 1958 Annual Election. The ballot will be similar to the listing which follows:

	Nomination by Past Presidents' Committee	Nomination by Letter
<i>For President—</i>		
FRANK W. EDWARDS	×	
<i>For Vice President—</i>		
DONALD S. MAGOWAN	×	
<i>For Secretary-Treasurer—</i>		
A. DOUGLAS SPICER	×	
J. P. MURPHY		×
<i>For National Director—</i>		
DWAIN M. WALLACE	Hold over	
C. J. McLEAN	×	
MELVIN AMSTUTZ		×
ROBERT A. BROWN		×

There will be one vote each for President, Vice President and Secretary-Treasurer. There will be three votes, non-cumulative, for National Director. The method of nomination will not appear on the Official Ballot.

A BUCK WILL GET YOU TWO, SEE PAGE 5

CONTENTS OF THIS ISSUE	Page
President's Message	1
1958 Ballot Information.....	1
Vox Secretarii	2
Recognition Dinners.....	2
Fuel and Power in the Iron and Steel Industry.....	3
Report of the National Director.....	7
Insurance for Society Members.....	8
\$4,000 Scholarship Offer.....	9
Cover Picture—Giant Radio and Radar Receiver.....	9

READ THE ADVERTISEMENTS

SUBSCRIPTION RATES

\$2.00 per year in advance to members of the Illinois Society of Professional Engineers. \$4.00 per year in advance to non-members in U.S.A. and its possessions, Canada, and Mexico. Foreign \$6.00. Single copies 40c. Published by the Illinois Society of Professional Engineers, Inc., at 614 East Green Street, Champaign, Illinois. Address all communications to the Illinois Society, P. E. Roberts, Editor, 614 East Green Street, Champaign, Illinois. The Illinois Society is not responsible for statements made or opinions expressed in this publication. Entered as Second Class Matter April 27, 1949, at the Post Office, Champaign, Illinois.

VOX SECRETARII

By P. E. ROBERTS, *Executive Secretary*

Annual Election of Officers

Within two short weeks after this issue reaches you the 1958 official ballot will be mailed to corporate members. Departure from the norm this year adds three candidates for office by petition. In other words, three candidates on the ballot were not named by the regular Nominating Committee, which is also the three latest available past presidents.

Membership

Applications received as a result of the Fall membership campaign are encouraging. The Society will end its 72nd year with a greater increase in membership than it has enjoyed in many years. To borrow a salesman's adage, "When you have them on the run, keep them running."

Dues Increase

This is to remind you once again that statements for National members will be \$25.00 instead of the usual \$20.00, the additional \$5.00 being the Chapter dues, which are collected by the Executive Secretary's office for the first time this year. With the ambitious programs that several Chapters have begun, this increase in Chapter revenue will put the Chapter on an about even basis financially. Those Chapters which have been reluctant to increase their activities locally now will have the funds to do so.

Sickness and Accident Insurance

The Continental Casualty Insurance Sickness and Accident Program is being very well received by the members of the Society. In other columns a story by Mr. Jerry Harris on the plan will be found. It is interesting to note that one of the members in the St. Louis area has already collected just under \$100 on a sickness claim. It will pay you to listen when the representative of the company calls on you.

A BUCK WILL GET YOU TWO, SEE PAGE 5

RECOGNITION DINNERS

Chicago Chapter

On October 10 Chicago Chapter held its Professional Recognition Dinner in the Engineers' Club. Of the 143 who attended, 93 were guests and the balance were representatives of engineering society members of Illinois Engineering Council. Council President, Daniel K. Chinlund, served as toastmaster, introducing the representatives of the various societies, who in turn introduced the newly registered engineer guests.

Following the introduction of guests Dr. Edwin R. Whitehead, a member of the Professional Engineer Ex-

aminating Committee, requested that all rise and read with him the Engineers Creed. The ceremony was most impressive.

Father James G. Jones, Jr., Chaplain of the Cook County Jail, gave an inspirational and informative talk on present day penal problems and subsequent readjustment problems. The whole program was excellently conducted.

Peoriarea Chapter

On October 17, 75 engineers, 25 of whom were guests, sat down to dinner in the new Bradley University Student Center. Each of the guests was introduced by a member of the Peoriarea Chapter. After the introduction of guests had been completed, Dwain Wallace, who, incidentally, had the pleasure of introducing his son Ronald as a newly registered E-I-T, requested those present to rise and repeat after him the Engineers Creed.

Those present heard City Manager George A. Bean discuss a few of the problems he has encountered in his profession. Mr. Bean is an engineer himself and has served several communities as City Manager.

Dixon, Galesburg, Waukegan, Elgin, Rockford, and Decatur

Details are not available; however, on October 3 three reservations were made for the recognition dinner held at Rock River Chapter in Dixon. Three reservations were made for the West Central Chapter recognition dinner held in Galesburg on October 16. Five reservations were made for the Lake County Chapter dinner held in Waukegan on October 16 and addressed by President Neureuther. Fourteen reservations were made for the DuKane Chapter dinner held in Elgin on October 17. Three reservations were received for the Rockford dinner which was held on November 7, and 35 reservations were received for the joint Capital, Central Illinois and Campaign County Chapter dinner which was held in Decatur on November 6. Miss Binks, Director of the Department of Registration and Education, spoke at the Decatur dinner.

The consensus of those who have attended the dinners this year is that it is much less confusing to introduce the newly registered engineers than to actually make the presentation of registration certificates, as was done two times before. Also, the reading of the Engineers Creed is an impressive ceremony and one which should be used at least once a year by every Chapter. The cooperation between Illinois Engineering Council and the Illinois Society has been on the highest level and it is encouraging to observe the enthusiastic manner with which these dinners have been organized and conducted. There is no better concrete example of unity available.

MARRIAGE: A union between 2 people in which the man pays the dues.—Charley Jones

A BUCK WILL GET YOU TWO, SEE PAGE 5

A BUCK WILL GET YOU TWO, SEE PAGE 5

Fuels and Power in the Iron and Steel Industry

By DR. WALTER H. VOSKUIL*

A detailed report of fuels and electric power used in manufacturing was made by the Bureau of the Census in 1947 and again in 1954. The two reports, together with data from the Census of Manufactures on employment and value of output of manufacturers form the basis of this report.

The Census data available for the two years—1947 and 1954—permit a comparison of changes in quantities and costs of each of the fuels used, the quantities of fuels and power used per worker, on each industry or industry group, the quantities of electricity used in each type of manufacturing industry, and a comparison of wage costs with fuel and power costs.

Because fuel is an important element in the cost of iron and steel manufacture, an analysis of the changes in fuel consumption and costs that are given in the Census reports on this industry for 1947 and 1954 are here given.

Fuels Used in Iron and Steel Making. When taken alone, iron and steel use one-third of the fuels and power used by all the manufacturing groups. Fuels used in the production of pig iron and steel are bituminous coal, anthracite, coke, fuel oil, natural gas, manufactured gas, mixed gas, tar, and electric power. Though all are derived from primary fuel sources, bituminous coal, anthracite, natural gas, petroleum and water power, yet the largest quantities used in iron and steel making are the processed fuels—coke and manufactured gas. The contribution of each of the fuels is shown in Table 1.

Fuel Changes in Iron and Steel, 1947 to 1954

The changes that have occurred in the iron and steel industry in the interval of seven years of which comparable Census reports are available is given in Table 2. Of special interest in this table is the differential between increase in payroll costs and fuel costs.

Table 2.—Blast Furnaces and Steel Plants (Census data)

Item	1947	1954	Percent change
No. of employees	536,096	518,690	-3.25
Payroll, \$1,000	\$1,703,143	\$2,418,635	42.01
Average payroll	\$3,177	\$4,663	46.8
Fuels used, trillion b.t.u.'s			
coal	261.42	141.03	-46.05
coke	1,528.33	1,314.35	-14.00
fuel oil	298.43	259.85	-12.93
gas	596.90	813.24	36.24
Total	2,685.08	2,528.47	-5.83
Cost of fuels, \$1,000	\$974,461	\$1,216,554	24.84
Percent fuel cost of payroll	57.22	50.30	
B.t.u.'s per worker, millions	5,009	4,875	-2.68
KW hrs. per worker	31,368	49,307	57.19
Fuel costs cents per million b.t.u.'s			
coal	19.34	23.16	19.75
coke	41.05	60.85	48.23
fuel oil	49.97	51.33	2.8
gas	21.14	27.54	30.42
Pig iron produced, M tons	58,327	57,948	-.65
Ignot steel produced, M tons	84,894	88,312	4.0
Electric steel, produced M tons	3,788	5,436	43.5

Total fuel consumption declined slightly, although the output of pig iron varied less than 1 percent and steel ingot output increased 4 percent. Use of natural gas gained at the expense of coal and fuel oil.

Consumption of electric power increased, in total and per worker, due, in part, to the increased output of electric steel.

Fuel Costs.—The cost of coke, the principal fuel in the iron and steel industry, rose sharply from 1947 to 1954; fuel oil costs remained high; coal remains the lowest cost fuel.

* Dr. Walter H. Voskuil, Principal Mineral Economist, Illinois State Geological Survey, and Professor of Mineral Economics, College of Engineering, University of Illinois, Urbana, Illinois.

Table 1. Summary of Fuels Used in Iron and Steel Manufacture
1947 and 1954
(value in thousands)

	Quantity		Percent change	Cost		Percent change
	1947	1954		1947	1954	
Bituminous coal and anthracite, M tons	10,619	5,383	-49.3	53,733	32,658	-39.2
Coke, M tons	59,195	50,552	-14.6	631,675	799,838	+26.6
Fuel oils, M barrels	50,444	43,893	-13.0	149,265	133,376	-10.6
Natural gas, million c/f	75,932	3,252,956	+36.2	21,538	223,955	-77.4
Manufactured gas	999,882			36,796		
Mixed gas	1,312,081			67,928		
Other fuels				21,228	26,727	+21.2
Purchased electric power, million KW hrs.	14,256	14,062	-1.3	93,160	132,526	+42.2

Blast Furnace Fuel Costs.—In the process of pig-iron manufacture, the most important cost items are fuels and materials; direct labor costs (wages paid) are considerably less.

Table 3.—Pig Iron Cost Data 1947 and 1954^(a)

	1947	1954
Pig iron produced, net tons	58,339,942	57,947,551
Value of pig iron produced (\$1,000)	\$1,708,313	\$2,885,240
Value, per ton	\$29.28	\$49.93
Cost of fuel in pig iron production (\$1,000)	\$634,111	\$796,000 (est.)
Less Value of blast furnace gas recovered and sold, (\$1,000)	\$52,925	\$89,589
Net fuel cost, (\$1,000)	\$581,186	\$706,411
Net fuel cost per ton of pig iron	\$9.96	\$13.92
Wages and salaries paid, (\$1,000)	\$111,413,000	\$164,447,000
Wages and salaries per ton of pig iron	\$1.90	\$2.84
Cost of materials, parts, containers, and supplies (mainly ore), (\$1,000)	\$751,673	\$1,325,571
Cost per ton	\$12.88	\$22.88
Valued added by manufacture, (\$1,000)	\$328,060	\$620,250
Value added per ton	\$5.61	\$10.70

^(a) Sources: Bureau of Mines, Bureau of the Census.

Special Fuel Problems of the Iron and Steel Industry

The distinctive characteristic of primary iron and steel industry is the large quantities of fuel and power required in the process of freeing the metal from the ores. This industry takes 33 percent of all fuels used in all manufacturing.

Another way of looking at the relationship of fuel costs to other costs in the iron and steel industry is to compare them with wages paid. In this group the cost of fuel is 56 percent of the money paid out in wages and salaries, whereas for all manufacturing industries it is only 10.0 percent.

Among the fuels used by the iron and steel industry, coke is the most important from the point of view of both quantity and cost. Coke for metallurgical use must meet rather exacting conditions. It must be hard, porous, strong load-bearing, and low in sulfur. While all other steps in manufacturing can, with occasional exceptions, use oil and gas as well as coal for the needed fuel requirements, the initial step in the manufacturing process—getting the metal out of the ore—can be taken, for all practical purposes, only with coke from coal. The fuel is so special and exacting in its nature that a special term, "coking coal," is applied to those coals from which coke or (more narrowly) metallurgical coke can be made.

Because fuel costs comprise so large a proportion of the costs of pigiron production, analysis should be carried further. We should like to know the cost of coke, what elements comprise this cost, and—if an estimate is possible—what further changes may be expected.

Three elements are significant in the cost of coke delivered at the blast-furnace plant: (1) mine price of coal; (2) transportation costs from mine to coke plant; and (3) cost of processing coal into coke.

Location of coking coal deposits.—Currently 90 percent of coal used in the manufacture of coke comes from five states—West Virginia, Pennsylvania, Kentucky, Alabama, and Virginia. Coking coal for the western steel industry is obtained from Utah, Colorado, and New Mexico. Fourteen counties in four Appalachian states, Pennsylvania, Eastern Kentucky, West Virginia and Virginia supply 97 percent of the coking coal for ovens in Pennsylvania, Maryland, Ohio, New York, Michigan, Illinois, and Indiana.

A summary of coking coal destinations for 1956 is shown in Table 4. Principal long distance movements of coal are from West Virginia and Eastern Kentucky to Illinois, Indiana, and Michigan. Not so far is the haul from Pennsylvania and West Virginia to Lackawanna, New York, and movements to eastern Ohio and western Pennsylvania, from West Virginia, Pennsylvania, and eastern Kentucky may be considered as almost local.

Table 4.—Sources of Coking Coal for By-Product Ovens in Major Pigiron Producing States, 1956

Origin	Penna.	Virginia	W. Virginia	E. Kentucky	Total "
Destination					
Illinois	6	172	1,745	1,541	3,939
Indiana	49	540	6,900	4,865	12,449
Maryland	370	6	4,016	4,393
Michigan	376	548	2,726	1,157	4,807
New York	3,316	421	1,261	527	5,525
Ohio	6,105	547	7,771	2,409	16,832
Pennsylvania	21,407	31	6,928	384	28,750
W. Virginia	4,116	—	1,969	—	6,036

^a Small tonnages from other states included.

The mine price of coking coal in 24 leading counties in 1947 and 1955 is shown in Table 5 together with the percent change in price from 1947 to 1955 from each county and for the state average. Almost without exception, prices of coking coal have advanced more rapidly than coal marketed for other purposes. This trend is expected to continue.

Transportation costs: Freight rate increases have gone into effect several times since 1947 and these increases together with mine price increases are reflected in the cost of coking coal at the oven. These changes are shown in Table 6.—Value of Coal at By-Product Ovens.

LEE I. OSBORN

Engineer-Contractor

Bridges
Foundations
Docks & Pile Driving

Drainage & Levee Work
Heavy Excavation
Grading & Paving

P. O. Box 2

Muscataine, Iowa

Table 5.—Mine Prices of Coking Coal in 24 Counties,
1947 and 1955

State and County	1947	1955	Percent change
Alabama	\$5.48	\$5.68	+3.6
Jefferson	5.48	5.97	+8.9
Colorado	4.53	5.63	+24.3
Las Animas	4.73	7.11	+50.5
E. Kentucky	4.88	4.91	+0.6
Harlan	5.08	5.64	+11.0
Letcher	5.00	5.17	+3.4
Floyd	5.10	5.25	+2.9
Pike	4.56	4.83	+5.9
Pennsylvania	4.23	5.14	+21.4
Allegheny	3.94	5.55	+40.9
Cambria	4.90	5.82	+18.8
Fayette	4.19	5.95	+18.1
Greene	4.11	5.52	+34.3
Indiana	4.33	4.79	+10.6
Somerset	4.51	4.67	+3.5
Washington	4.26	5.97	+40.0
Westmoreland	4.04	4.76	+17.8
Virginia	4.83	4.60	-4.1
Buchanan	4.85	4.53	-6.6
Tazewell	4.94	5.28	+6.9
Wise	4.49	4.23	-5.8
West Virginia	4.48	4.70	+4.9
Boone	4.64	4.74	+2.1
Fayette	4.96	4.79	-3.4
Kanawha	4.51	4.53	+0.4
Logan	4.54	4.53	-0.1
Marion	3.71	4.90	+5.1
McDowell	4.85	5.62	+15.8
Mercer	5.26	5.20	-1.0
Raleigh	5.01	5.33	+6.4
Wyoming	4.89	5.03	+2.9

Table 6.—Value of Coal at By-Product Ovens, 1947 and 1956

State	1947	1956	Percent change
Illinois	9.38	10.44	11.3
Indiana	9.35	10.58	13.2
Alabama	6.48	7.68	18.5
Michigan	8.26	9.76	18.1
New York	9.48	10.60	11.8
Ohio	8.11	9.35	15.3
Pennsylvania	7.22	8.36	15.7
W. Virginia	6.14	6.97	13.5

ROCKFORD LADIES AUXILIARY

The Ladies Auxiliary, Rockford Unit, has been active this fall. On October 15, 54 attended a ladies night with Rockford Chapter as hosts. The meeting was held in the YMCA River Room and those present not only enjoyed the roast beef, but also the conversation and the movies following dinner.

Mrs. C. H. (Mary) Wilson reports that a busy year ahead has been planned for the auxiliary by Mrs. Royce Johnson, Program Chairman.

HAMDEN TESTING SERVICES, INC.

Soil Mechanics Laboratory & Field Tests

7956 Oakton Street Chicago 31, Ill.

SPring 4-2435

ROSTER

REGISTERED

STRUCTURAL ENGINEERS

State of Illinois

This handy 5½" x 8½" book is the first alphabetical listing of the names, addresses and license numbers of Structural Engineers registered in Illinois.

The book was published through the cooperation of the Department of Registration and Education, State of Illinois.

An added service of the Illinois Society of Professional Engineers.

The price of 50c covers the cost of publication, handling and mailing. Order two copies while the supply lasts. Use the coupon below.

Illinois Society of Professional Engineers
614 East Green Street
Champaign, Illinois

☐ Enclosed is a Buck for 2 copies

☐ or \$.....for.....copies

Roster of Registered Structural
Engineers in Illinois

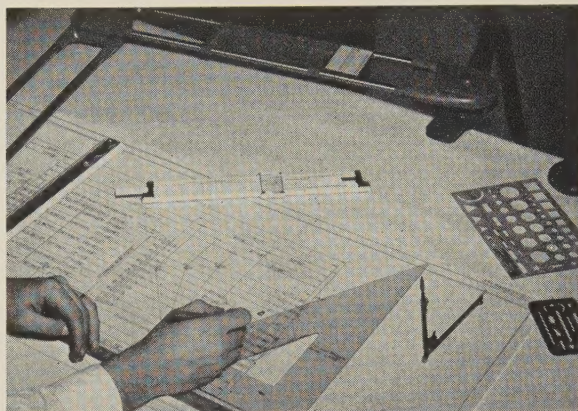
NAME.....

ADDRESS.....

TOWN.....

Engineered . . .

for your protection



A plan of Sickness and Accident Income Protection
Hospital - Surgical - Medical Benefits

Endorsed by the

Illinois Society of Professional Engineers, Inc.

Available only to members, their families and employees
IP-7473 AP-11856 U IP-11763 AU Series

Underwritten by

CONTINENTAL CASUALTY COMPANY

CHICAGO, ILLINOIS

Full details will be explained by an authorized representative who will call on you. We strongly urge you to participate.

Your Endorsed protection program is offered only through:

HARRIS ASSOCIATES

Intermediate Division Association Counselors

105 West Madison Street

Chicago 2, Illinois—Telephone STate 2-9327, all depts.



America's No. 1
Accident & Sickness
Insurance Company

IN EXCESS OF TWO MILLION CLAIMS PAID TOTALING MORE THAN \$770,000,000.00 ALL DEPARTMENTS

REPORT OF NATIONAL DIRECTOR

Fall Meeting—Bismarck, North Dakota

By W. WAYNE WALLACE

The fall meeting of the Board of Directors of the National Society of Professional Engineers was held October 17, 18 and 19 in Bismarck in conjunction with the 1957 annual meeting of the North Dakota Society of Professional Engineers. All but three of the forty-five member chapters were represented.

Following an excellent smorgasbord at the Bismarck Municipal Country Club Thursday evening, the meeting got under way with reports by President Dyer, Executive Director Robbins, and Treasurer Allen. The highlight of the evening was the distribution of \$10,000 to the various state chapters in recognition of membership gains. Illinois, receiving \$340.50, ranked eighth among the thirty-two recipients.

It will be recalled that the Board, two years ago, authorized distribution of \$10,000 each year for a three year period to the various state member societies in proportion to membership growth. Following consideration of the Treasurer's report, and a thorough discussion of the budget, the Board approved a recommendation that this refund be discontinued for the third year in order to balance the 1958 budget.

In his talk, President Dyer stressed the need for implementation of the various programs of the Society at the state level. He also pointed out that additional funds must be provided to carry out these programs or we must reduce the number of activities to come within funds available. In this connection, the Board authorized appointment of a special committee to investigate the possibility of a dues increase.

Scholarship Program

Many committee reports were presented at the Friday and Saturday business sessions. Among these was the report of the Young Engineers Committee, which during the year, considered a proposal by Armco Drainage and Metal Products, Inc. to set up a \$15,000 a year civil engineering scholarship program to be administered by NSPE. The Board adopted the report and approved the following:

1. The Board of Directors approves the policy of NSPE entering into agreement with associations, foundations, corporations, companies or individuals desiring to make scholarship and fellowship grants in the engineering field—these grants to be administered by NSPE.

2. The Armco proposal dated August 30, 1957, is approved with the provision that such changes be made as appear desirable by Armco and the NSPE administrative group.

3. The President of NSPE is authorized to appoint a committee known as the Engineering Scholarship Committee charged with the responsibility of admin-

istering the Armco scholarship plan and other scholarship plans received by the Society. This committee also may solicit and negotiate scholarship grants for engineering students for other industries, associations, foundations, corporations and persons.

Shortage of Engineers Statement

The following statement concerning the engineering shortage was authorized by the Board:

Within recent weeks related developments have provided fresh evidence for those who contend that there is a severe shortage of engineering and scientific personnel and, at the same time, for those who maintain that there is not a shortage. This contradictory situation has existed since 1949 when the largest engineering graduating class in history led to predictions of an oversupply—followed a year later by the Korean War, the increase in defense spending and the subsequent high demand for engineering and scientific personnel.

Since then many leaders in public life and industry had expressed a fear that the output of trained engineering talent has been lacking in numbers to the extent that the nation's security is in jeopardy, and called for various forms of "crash" programs to produce more engineers. Others have contended during this period that the "shortage" was synthetic, or highly exaggerated.

Recently defense budget cuts caused the layoff of a number of aircraft employees, including some 1,000 engineers. This resulted in extensive publicity to the effect that the "shortage" was over and that more engineers would be "laid off" as further cuts were made in defense spending. Now, the launching of the Russian earth satellite has resulted in even more extensive statements and publicity that the United States is trailing Russia in scientific achievement because we have not produced enough engineers and scientists compared to the USSR. New demands are being voiced for "crash" programs to train larger numbers of engineers and scientists. Some leading members of Congress have stated that they will move for extensive Federal scholarship programs when the legislators resume their work next January. In the face of this "on-again off-again" situation, the engineering and scientific professions and the general public are understandably confused and uncertain.

The validity of each point of view regarding the supply of engineers depends on interpretation and analysis of data which have been published in great detail and variety. Despite this wealth of information, however, both points of view probably can be defended if the definitions of two terms—"engineer" and "shortage"—are made by the respective group.

The National Society of Professional Engineers has observed and studied the various statements, reports and analyses during this period. We recognize an obligation to the nation's economy, the engineering profession and to the young people who may be consider-

ing the choice of an engineering career, to lend assistance in the clarification of these conflicting viewpoints, and to the extent possible to assist in the selection of the best alternatives in the future.

It is most important that the nation not rush into hastily-improvised actions having to do with the education of engineers which would only aggravate a complicated and difficult condition which cannot be solved by spur of the moment solutions.

Guidance Factors

Based on close observation of the engineering profession's growth and intimate experience in professional engineering activities, N.S.P.E. believes that the following factors are sound observations for future guidance:

1. Special action to increase today's supply of engineers is not considered necessary or desirable since engineering enrollments are at an all-time high and are continuing to increase.
2. An artificial stimulation to further increase enrollments in engineering will severely handicap institutions that devote adequate attention to the capable students.
3. Assumption that Russia launched the earth satellite before the United States solely because it had trained more scientific personnel in recent years than this country, we believe is not valid and could lead to unwise and damaging decisions. We believe it would be more logical to assume that the controlling factors were priorities assigned to money and emphasis, rather than a shortage of technical personnel in the United States.
4. Emphasis now more than ever should be placed on quality rather than quantity. Potential engineers should be better grounded in fundamentals when they enter the engineering educational programs and should be better informed as to the qualifications essential for an individual to become a successful engineer.
5. In view of the present limitations of facilities and faculties, the substantially-increased enrollments in our engineering institutions are causing serious difficulties at the present time. Any program which will substantially add to the present number of students must include means to resolve these limiting factors.
6. It should be emphasized that projects such as the earth satellite, guided missiles, etc., depend on highly-advanced technical knowledge which is necessary. It should also be noted that any program based on present needs will not succeed in solving today's technological problems. A program starting today will not produce a single highly-qualified engineer or scientist for at least six years.
7. Experience has shown that we have wasted engineering talent by using it at a level below that which it is capable of performing. Improved utilization of engineering talent can do more for an immediate need than any other single program.

The outstanding talk by North Dakota's Governor, J. E. Davis, featured the Friday evening banquet which was attended by more than 300 professional engineers and their wives. The North Dakota Society's Arrangements Committee, headed by E. J. Booth, is to be highly commended for the splendid arrangements they made for this fall meeting. All Board members will remember for a long time, the convenience and comfort they enjoyed through the privilege of using the House Chambers in the State Capitol Building. Long to be remembered also, was the performance of the Transportation Committee, the local men who efficiently and promptly furnished transportation back and forth between hotels and meeting places.

INSURANCE FOR SOCIETY MEMBERS

By JERRY HARRIS

Your Society has one major goal—that of serving you in the most effective manner possible. Therefore, we are constantly searching for ideas and innovations which will make this goal a reality. We firmly believe that a secure member is a better member. A Society comprised of individuals who have a strong sense of security is a better and stronger Society, better capable of rendering full service.

We have been desirous of bringing to our membership a form of protection that would provide something out of the ordinary; a form of coverage that is protection out of the ordinary sense. After careful study your Society has made possible an outstanding insurance program for the membership.

This plan offers members an entirely new concept in insurance coverage. For the first time in the existence of the Society, an exclusive form of Health and Accident, Catastrophic Hospital and Overhead Business Expense insurance is being made available to members of the Illinois Society of Professional Engineers, their families and employees.

The company chosen to underwrite this outstanding protection plan is the Continental Casualty Company of Chicago, Illinois, one of America's largest insurance companies. Continental is a sound stock company with strong financial reserves. Adequate reserves are carried for outstanding claims and a favorable liquid position is maintained. This company has been underwriting Association Groups successfully for over a half century. Furthermore, it is a company licensed in all 48 states, the District of Columbia, Puerto Rico and Hawaii. It functions in Illinois under state supervision.

The advantage of this plan to you as a member is that a better and more dependable protection can be had under the Illinois Society of Professional Engineers sponsorship at a substantial savings in cost. This savings is due to the mass purchasing power of our Society.

Each member may decide on his own initiative to enroll. An authorized and approved representative will call on you to explain these plans. This insurance program is Society sponsored and deserves your support. You owe it to yourself and your family to take time to talk with the representative of Continental Casualty Company when he calls on you. His program offers you excellent protection at greatly reduced cost.

Only bona fide members, their families and employees of the Illinois Society of Professional Engineers are eligible to participate in this program.

The insurance company is establishing for the Society a plan of disability coverage that will serve the best interest of the majority of the membership. We urge each member to investigate this outstanding coverage—made available only through your Society's sponsorship.

A BUCK WILL GET YOU TWO, SEE PAGE 5

\$4,000 SCHOLARSHIPS OFFERED

By EDWARD E. BAUER

Highway Contractors in Illinois are aiding materially in interesting Illinois high school students to consider highway engineering as a career. Two \$4,000 scholarships are provided each year for Illinois high school graduates who want to study in this field in the Department of Civil Engineering at the University of Illinois. In addition, a \$1,200 award is available to a graduating senior in highway engineering at the University of Illinois for travel by car the summer following graduation.

The two \$4,000 scholarships, known as Associated General Contractors of Illinois scholarships, were first awarded in 1955. One is financed by the Association and the other one by two contractor members of the Association, S. J. Groves and Sons Company, Springfield, Ill., and McDougal Hartmann Company, Peoria, Ill.

Interested high school seniors are invited to compete by writing an essay on "Highway Engineering as a Career" and submitting personal data and recommendations. From the group of contestants ten finalists are chosen to come to the University of Illinois for interviews with the judging committee and to spend the balance of the day seeing the University at work. From the group of finalists two winners and two alternates are selected. Payments on the scholarships are made in increments of \$500 as the student registers for each of the eight semesters.

Funds for the traveling award for the senior are provided by an Illinois highway contractor who desires to remain anonymous. The award is known as the C. C. Wiley Traveling Award in Highway Engineering, so named to honor C. C. Wiley, Professor of Highway Engineering, Emeritus.

The award is based principally upon the excellence of a design project carried out by students in the senior highway design course, with consideration given also to scholastic standing, personal characteristics, and demonstrated interest and ability to profit from travel.

The award is for travel by car in the United States during the summer following graduation to study and report upon highway transportation problems in the states visited. The itinerary is planned by the Department and arrangements are made in advance for contacts by key personnel along the route. The award winner is required to take notes and pictures, and prepare a comprehensive report upon completion of the trip.

Robert J. Young is Executive Secretary of the Contractors Association with headquarters at Springfield, Illinois. Paul F. Kent, Champaign, Ill., is Chairman of the Association's Scholarship Committee. Ellis Danner, Professor of Highway Engineering at the University of Illinois is chairman of the judging committee and adviser to the scholarship winners while at the university. Stanley H. Pierce, Associate Dean, College of Engineering, and Ralph Bartelsmeyer, Chief Highway Engineer of the Illinois Division of Highways are the other judges.

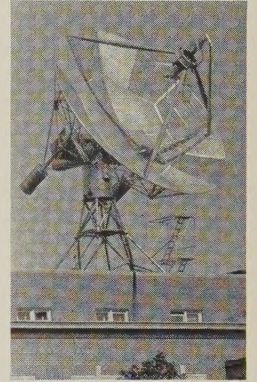
Professor Danner is also chairman of the committee selecting the Wiley award winner. John W. Hutchinson is the instructor in charge of the design problems for the Wiley Award and arranges the travel. N. M. Newmark is head of the Department of Civil Engineering.

GIANT RADIO AND RADAR RECEIVER

Sputnik has erased all doubt in the minds of the public as to whether an earth satellite was possible and feasible. Scientists have known for many years that an earth satellite was not only possible, but probable.

The launching of Sputnik by Russia, dramatic by being the first, is of no real consequence simply because it is first. Very few people know or could tell you which railroad was the first to use diesel locomotive power. The important consideration is not who is first, but how well the knowledge gained by experiments of this kind is used.

Scientists and engineers in the United States have gone much further toward launching and



studying an earth satellite than is generally realized.

Last summer, without much fanfare, a parabolic receiving antenna 28 feet in diameter was erected on top of the Electrical Engineering Building on the campus of the University of Illinois. At the time of its erection the story was released that a study was being made on the transmission and reception of radar waves. A transmitter at the Army's Evans Signal Laboratory at Belmar, New Jersey, projected these waves to the moon and the reflected signal was gathered and amplified in the receiver. On October 10 a story was released by the University of Illinois recounting successful preliminary results.

One other useful purpose of the parabolic receiver will be to gather data on "Luna Ann," (the first U. S. earth satellite) which will be launched by United States engineers and scientists.

It is fitting, therefore, that the cover of this month's issue give a general picture accompanied by the close-up picture above. The photographic work was done by W. Hayden Smith, a senior laboratory mechanic in Mechanical Engineering.

The receiver is one of a whole series of projects which are being carried forward by University of Illinois engineers and scientists. Some of these projects are not nearly so dramatic, but each one will contribute an important part to the advancement of science and engineering.

The grass may look greener next door, but it's just as hard to cut.—*Grit*

A BUCK WILL GET YOU TWO, SEE PAGE 5

PROFESSIONAL DIRECTORY

DE LEUW, CATHER & COMPANY

CONSULTING ENGINEERS

Public Transit	Subways
Traffic and Parking	Railroad Facilities
Expressways	Industrial Plants
Grade Separations	Municipal Works
Urban Renewal	Port Development

150 North Wacker Drive, Chicago 6
 San Francisco Toronto Oklahoma City

GREELEY AND HANSEN

ENGINEERS

Water supply, Water Purification, Sewerage, Sewage Treatment, Flood Control, Drainage, Refuse Disposal

220 SOUTH STATE STREET
 CHICAGO 4, ILL.

ALVORD, BURDICK & HOWSON

Water Works	Water Purification	Flood Relief
Sewerage	Sewage Disposal	Drainage
	Power Generation	Appraisals

20 NORTH WACKER DRIVE CHICAGO 6, ILL.

ROCK ISLAND BRIDGE & IRON WORKS, INC.

Charles R. Roberts, Member NSPE, President
 FABRICATED STRUCTURAL STEEL FOR
 BRIDGES AND BUILDINGS

1603 Mill Street Phone 6-4405
 Rock Island, Illinois

JENKINS, MERCHANT & NANKIVIL

Consulting Engineers

Municipal Improvements	Sewerage
Power Development	Water Systems
Traffic Surveys	Industrial Plants
Flood Control	Recreational Facilities
Air Ports	Investigations and Reports

805 East Miller Street Springfield, Illinois

CRAWFORD, MURPHY & TILLY

CONSULTING ENGINEERS

Water Works, Sewerage, Airports, Street Improvements, Traffic Surveys

PHONE 8-5619

755 S. GRAND AVE., WEST SPRINGFIELD, ILL.

BELING ENGINEERING CONSULTANTS

DESIGNERS OF



Heating, Air Conditioning, Plumbing and Electrical Systems for Buildings • Water and Sewer Systems and Plants
 Municipal Engineers • Subdivision Planners

307 — 16th St., Moline, Illinois

1011 Main St., Peoria 5, Ill. 10 Third Ave., Joliet, Ill.
 811 W. Springfield Ave., Champaign, Ill. 914 Grand Ave., Des Moines 9, Ia.
 306 Park Ave., Rockford, Ill. 314 N. 4th St., Burlington, Ia.

RUSSELL AND AXON

CONSULTING ENGINEERS

Civil—Sanitary—Structural
 Industrial—Electrical
 Rate Investigations

408 Olive Street, St. Louis 2, Missouri
 Municipal Airport, Daytona Beach, Florida

STANLEY ENGINEERING COMPANY

Consulting Engineers

Hershey Building 208 South LaSalle Street
 Muscatine, Iowa Chicago 4, Illinois

CRESCENT ENGINEERING COMPANY, INC.

Contracting and Consulting Electrical Engineers
 Design, Supervision and Construction

Process Power and Lighting for Industrial Plants

6455 S. CENTRAL AVENUE CHICAGO 38, ILL.

HOWARD C. HARDY AND ASSOCIATES

CONSULTANTS IN ACOUSTICS

Architectural Acoustics Noise Surveys

Noise Control of

Factories, Offices, and Living Areas

22 West Madison St. Phone ANdover 3-6069
 Chicago 2, Illinois

SOIL TESTING SERVICES, INC.

Consulting Engineers

Soil Investigations—Laboratory Testing
 Foundation Recommendations and Design

3521 N. Cicero Avenue Chicago 41, Illinois
 Milwaukee, Wis. • Portland, Mich. • Kenilworth, N. J.
 San Francisco, California • Havana, Cuba

SCHIRMER ENGINEERING CORP.

FIRE PROTECTION ENGINEERS

Nationwide fire protection, engineering, consulting and inspection service. Preparation of schematic sprinkler design layout drawings and specifications, special hazard protection layouts, and specifications.

We visit over 3500 cities semi-annually.

2447 W. Peterson Avenue Chicago 45, Illinois
 Phone—LONgbeach 1-5269.

CONSOER, TOWNSEND AND ASSOCIATES

Water Supply, Sewerage, Flood Control and Drainage, Bridges, Express Highways, Paving, Power Plant, Appraisals, Reports, Traffic Studies, Airports
 Gas and Electric Transmission Lines
 Superior 7-7054
 360 E. Grand Ave., Chicago 11, Illinois

ABOUT THE WEATHER

The surprise snow which fell on the Chicago area on October 25 and 26 was about two weeks ahead of schedule according to the data which has been supplied by L. A. Joos, U. S. Weather Bureau State Climatologist. The following story and table were prepared by Mr. Joos.

First One-Inch Snow in 24 Hours for Illinois

The occurrence of the first snowfall of one inch or more in 24 hours is an important item for highway safety, snow removal operations, construction, and for the merchandising of many kinds of winter equipment, clothing, snow shovels, etc.

The probabilities given below are based on an analysis of past records by H. C. S. Thom. It is essentially a statement of "climatic risk" concerning the occurrence of this important event.

Probability that the first snowfall of 1" or more will have occurred by the dates indicated:

City	5%	10%	30%	50%	90%
Madison, Wis.	Oct. 29	Nov. 5	Nov. 20	Nov. 30	Dec. 26
Dubuque, Iowa	Oct. 28	Nov. 5	Nov. 20	Dec. 1	Dec. 26
Chicago, Ill.	Nov. 5	Nov. 12	Nov. 26	Dec. 6	Dec. 30
Burlington, Ia.	Oct. 23	Nov. 2	Nov. 21	Dec. 4	Jan. 6
Moline, Ill.	Nov. 7	Nov. 14	Dec. 1	Dec. 11	Jan. 14
Peoria, Ill.	Nov. 1	Nov. 10	Nov. 29	Dec. 12	Jan. 12
Springfield, Ill.	Nov. 1	Nov. 11	Dec. 2	Dec. 17	Jan. 21
Terre Haute, Ind.	Nov. 9	Nov. 18	Dec. 6	Dec. 19	Jan. 19
St. Louis, Mo.	Nov. 12	Nov. 21	Dec. 9	Dec. 21	Jan. 22
Evansville, Ind.	Nov. 9	Nov. 20	Dec. 12	Dec. 24	Mar. 16
Cairo, Ill.	Nov. 12	Nov. 23	Dec. 16	Dec. 30	Feb. 19

Sample interpretation: At Peoria, Illinois the first 1" snow will have occurred by Nov. 1 in one year of 20; by Nov. 10 in one year out of 10; and by Nov. 29 in three years out of 10. The average date of the first occurrence at Peoria is approximately Dec. 12 and in 9 years out of 10 the first 1" snow will have occurred by Jan. 12.

The concept of climatic risk means that these probabilities are based entirely on the past records at these cities. It is entirely unrelated to short or long range predictions or forecasts for 1957 or for any other particular year.

L. A. Joos
U. S. Weather Bureau
Illinois State Climatologist

A BUCK WILL GET YOU TWO, SEE PAGE 5

The Professional Personnel Service

Serving the

SCIENTIFIC PROFESSIONS

Come in and see our free listings for
ENGRS.-MET.-CHEM.-SCIEN.-DRAFTSMEN

Thurs. to 7:30 P.M.—Sat. to 1:00

No charge to register with us.

BONNELL H. ALLEN, P.E., Owner

55 E. Washington, Chicago 2, RAndolph 6-4252

NEW MEMBERS

National

Arenson, Donald L., 3840 Jerome, Skokie. (Chicago)
Borrud, Bertram M., Route 4, Hickory Lane, Elgin. (DuKane)
Carlborg, Ralph H., 1408 Carmen Ave., Chicago. (Chicago)
Casey, William J., III, 347 Ashland Ave., Highland. (Chicago)
Cooper, James J., 2959 N. Mango Ave., Chicago 34. (Chicago)
Freeman, Wilmer C., 117 Tuttle, Clarendon Hills. (Chicago)
Geiger, Harold L., 707 Greenwood, Wilmette. (Chicago)
Kessler, Richard, 8111 Sycamore, Highland, Ind. (Chicago)
Law, John E., 347 Gale Ave., River Forest. (Chicago)
O'Brien, William F., Jr., 333 Parkview Road, Glenview (Chicago)
Pawlowski, Harry M., 1619 South 50th Ave., Cicero 50. (Chicago)
Renk, James M., 8626 South Rhodes Ave., Chicago 19. (Chicago)
Rutherford, Raymond E., 120 North 14th, Mt. Vernon. (Egyptian)
West, Robert H., 329 South 51st Ave., Bellwood. (Chicago)
Worel, Richard J., I, 17805 South Oak Park, Tinley Park. (Chicago)

Engineer-in-Training

Blomme, George W., 1930 1/2 Humboldt Blvd., Chicago. (Chicago)
Harris, James B., 1436 Commercial, Belleville. (St. Clair)
Holmes, John P., 5244 North Sawyer, Chicago. (Chicago)
Hughes, William R., 38 Sand Creek Drive, Decatur. (Central Illinois)
Kaiser, Walter R., 327 North Deere Park West, Highland Park. (Chicago)
Woodward, Peter, 1200 West Eddy Street, Chicago 13. (Chicago)

The returned hero chatted with his former professor, who inquired of the ex-student whether he had learned anything important from his war experiences. "Yes," sir, I have," the young man replied. "I have learned that it is easier to study history than to make it."—*Nuggets*

ORNAMENTAL METALWORKS COMPANY

Steel Stairs and Metal Railings
Miscellaneous Iron & Structural Steel
Cast Iron Frames & Covers
Manhole Steps
Pipe Railing
Flag Poles
Weir Plates
Bronze Bolts
Grating & Frames
Stop Plates & Grooves
Steel Doors & Windows
Stainless Steel, Bronze & Aluminum
Aluminum Sash and Doors
Thresholds

440 South Franklin Street, Decatur, Illinois

PHONE 8-3446

Fly Ash Aggregate for Road Material

Mountains of useless slag and fly ash at power plants may become miles of excellent cost-saving roads through cooperative research by the University of Illinois and the Illinois Division of Highways.

George W. Hollon, civil engineering instructor, has been studying and testing the material for more than a year. A trial section of highway shoulder was laid recently near Chicago. A section of the new type road may be built next spring in Lake County.

Illinois power plants alone produce 1½ million tons of slag and fly ash a year, and some pay up to \$1.25 a ton to haul it away. Hollon estimates this would make 210 miles of 24-foot road, and that five miles can be built at the cost of three miles of standard main highway.

Lime is used as the cementing agent with the slag-fly ash. Besides low cost, the mixture has other advantages. It is not affected by outdoor temperature changes, an important cause of damage to present roads. It can be worked for up to 16 hours after mixing. This would eliminate mixers at the road building site. Ordinary dump trucks can haul the material from a central continuous mixer.

Because the slag-fly ash-lime mixture wears away easily, it must be surfaced with black-top. Many present black-top roads are on a portland cement base. This is where the new material has its promise.

Hollon says its particular value is for building secondary roads, city streets, and parking lots. Several lots are to be built soon in Chicago. Portland cement remains the material of first choice for heavy duty main highways.

The test section is 1,200 feet of shoulder on Harlem Ave. south from 81st St. between Summit and Worth.

Melvin E. Amstutz, Lake County highway superintendent, plans a section of slag-fly ash-lime black-top road to be built next spring. He is particularly interested because crushed stone for permanent construction costs \$5.50 or more a ton in that area, while a million tons of slag and fly ash are available at little or no cost from just one power station dump along Lake Michigan in Waukegan.

Hollon says that waste lime, which has been used to make acetylene gas, is as good for making the mix as other lime costing twice as much. Four per cent of lime is used with 36 per cent fly ash and 60 per cent slag. The most critical item is water, which must be controlled within 1 per cent.

The mix is slower to season than portland cement, but continues to gain strength over a much longer period, according to laboratory and field tests.

Interestingly, the material is almost identical with that used by the Romans to build roads hundreds of years ago. Many of these still are in good shape. The Romans used lime with volcanic ash, which has chemical and physical properties almost identical with the slag and fly ash from modern power plants burning soft coal.

NAM Offers Eleven Points on Professionals

Under the title, "Satisfying the Salaried Employee," the National Association of Manufacturers has published a 64-page booklet which contains valuable information and suggestions on engineering and scientific employees, as well as other salaried groups. A section headed, "Special Needs of the Professional Employee," with particular emphasis on engineers and scientists, contains the following suggestions:

- | | |
|-----------------------------------|--|
| <i>Recognition</i> | 1. Realize that the professional employee wants to be recognized as a member of a profession. |
| <i>Credit</i> | 2. Insure credit and recognition from top management for outstanding work and unusual accomplishments. |
| <i>Titles</i> | 3. Give proper dignity to the title of each position held by a professional employee. |
| <i>Work</i> | 4. Provide work that will challenge the professional employee's technical competence. |
| <i>Promotion</i> | 5. Afford professional specialists opportunity for promotion and salary progression equivalent to that of members of management. |
| <i>Management-Team</i> | 6. Accept the professional employee as a member of the management team. |
| <i>Time-Off</i> | 7. Adopt liberal policies with respect to time off for personal reasons. |
| <i>Facilities</i> | 8. Provide physical facilities and equipment which meet the standards expected by professional employees. |
| <i>Specialization</i> | 9. Assist the recent professional graduate to identify himself with his specialty early in his training period. |
| <i>Professional Activities</i> | 10. Encourage professional employees to take part in the activities of their engineering or technical societies. |
| <i>Research & Development</i> | 11. Provide opportunities for research and development personnel to pursue independent interests, if practicable, with due recognition for achievements. |

Each item listed above is supplemented with reasons and comments. Other sections of the booklet deal with status and recognition, compensation, communication, supervision and typical programs of basic supervisory training. Copies are available from NAM's Industrial Relations Division, 2 East 48th St., New York City, at 50 cents per copy.

I hold every man a debtor to his profession;
from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavor themselves by way of amends to be a help and ornament thereunto.

Sir Francis Bacon

A BUCK WILL GET YOU TWO, SEE PAGE 5